

What is Claimed Is:

1. An apparatus for delivering a flow of gas to the airway of a patient, the apparatus comprising:

- a) gas flow generating means for providing a flow of a gas;
- b) gas delivery means adapted to be coupled to the gas flow generating means and adapted to be coupled to a patient for communicating the flow of gas with an airway of such a patient; and
- c) means for minimizing acoustic noise of the gas flow generating means by generating a cancellation frequency that at least partially cancels acoustic waves generated by the gas flow generating means.

2. The apparatus of claim 1, wherein the means for minimizing acoustic noise includes a speaker adapted to create cancellation acoustic waves as the cancellation frequency that at least partially cancels acoustic waves generated by the gas flow generating means.

3. The apparatus of claim 1, wherein the means for minimizing acoustic noise includes a mechanical vibration generating means, operatively coupled to the apparatus, for creating cancellation mechanical vibrations as the cancellation frequency that at least partially cancels acoustic waves generated by the gas flow generating means.

4. The apparatus of claim 3, wherein the gas flow generating means includes a pressure generator and a valve, wherein the mechanical vibration generating means includes dithering means for causing the valve to oscillate at a selected dither frequency as the cancellation frequency, and wherein the dither frequency substantially corresponds to an operating frequency of the pressure generator.

5. The apparatus of claim 1, wherein the means for minimizing acoustic noise includes a microphone adapted to generate a control signal for creating the cancellation frequency.

6. The apparatus of claim 5, wherein the means for minimizing acoustic noise includes a signal inverter adapted to invert the control signal from each microphone.

7. The apparatus of claim 6, wherein the means for minimizing acoustic noise includes a speaker adapted to create cancellation acoustic waves as the cancellation frequency, and wherein the speaker is driven by an inverted control signal from the signal inverter.

8. The apparatus of claim 5, wherein the microphone is an element of at least one of the group consisting of: snore detection means, apnea detection means, breathing disorder detection means, compliance detection means, patient detection means, voice recognition control means, means for conveying audible sounds to the user, breathing pattern detection means, patient monitoring means, diagnostic means, and auto-titration means.

9. An apparatus for delivering a flow of gas to an airway of a patient, the apparatus comprising:

- (a) a housing;
- (b) a blower assembly mounted in the housing, the blower assembly generating a flow of gas;
- (c) a gas delivery circuit coupled to an outlet of the blower assembly and adapted to communicate the flow of gas with an airway of such a patient; and

(d) a cancellation energy generating system adapted to create a cancellation energy that at least partially cancels acoustic waves generated by the blower assembly.

10. The apparatus of claim 9, wherein the cancellation energy generator is a speaker adapted to create cancellation acoustic waves as the cancellation energy that at least partially cancels acoustic waves generated by the blower assembly.

11. The apparatus of claim 9, wherein the cancellation energy generator is a mechanical vibration generating element operatively coupled to the blower assembly and adapted to create cancellation mechanical vibrations as the cancellation energy that at least partially cancels acoustic waves generated by the blower assembly.

12. The apparatus of claim 11, wherein the blower assembly includes a pressure generator, a valve in fluid communication with the pressure generator, and a controller operatively coupled to the valve to control actuation of the valve, wherein the controller causes the valve to oscillate at a selected dither frequency that substantially corresponds to an operating frequency of the pressure generator, such that the valve defines the mechanical vibration generating element.

13. The apparatus of claim 10, further comprising a detector adapted to detect a characteristic of acoustic noise of the blower assembly, and wherein the cancellation energy generating system creates the cancellation energy based on an output of the detector.

14. The apparatus of claim 13, wherein the detector is a microphone adapted to generate a control signal for creating the cancellation energy.

15. The apparatus of claim 14, wherein the microphone is an element of at least one of the group consisting of: snore detection means, apnea detection means, breathing disorder detection means, compliance detection means, patient detection means, voice recognition control means, means for conveying audible sounds to the user, breathing pattern detection means, patient monitoring means, diagnostic means, and auto-titration means.

16. A system for reducing acoustic noise of a medical device having a housing and a noise source mounted in the housing, the system comprising:

a detector within the housing adapted to detect a characteristic of acoustic noise of the noise source; and

a cancellation energy generator within the housing adapted to create a cancellation energy that at least partially cancels acoustic waves generated by the noise source.

17. The system of claim 16, wherein the cancellation energy generator is a speaker adapted to create cancellation acoustic waves as the cancellation energy that at least partially cancels acoustic waves generated by the noise source.

18. The system of claim 16, wherein the cancellation energy generator is a mechanical vibration generating element adapted to create cancellation mechanical vibrations as the cancellation energy that at least partially cancels acoustic waves generated by the noise source.

19. The system of claim 16, wherein the detector includes a microphone adapted to generate a control signal for the cancellation energy generator.

20. The system of claim 19, further including a signal inverter adapted to invert the control signal from the microphone.

21. The system of claim 20, wherein the cancellation energy generator is driven by an inverted control signal from the signal inverter.

22. A method for delivering a flow of gas to the airway of a patient, the method comprising the steps of:

- a) generating a flow of gas;
- b) delivering the flow of gas to an airway of a patient; and
- c) minimizing acoustic noise associated with generating the flow of the pressurized gas, delivering the flow of gas, or both, by creating a cancellation energy that at least partially cancels acoustic waves associated with generating the flow of gas, delivering the flow of gas, or both.

23. The method of claim 22, wherein creating the cancellation energy includes creating cancellation acoustic waves via a speaker as the cancellation energy that at least partially cancels the acoustic noise.

24. The method of claim 22, wherein creating the cancellation energy includes creating cancellation mechanical vibrations as the cancellation energy that at least partially cancels the acoustic noise.

25. The method of claim 24, wherein creating cancellation mechanical vibrations includes causing a pressure/flow control valve to oscillate at a selected dither frequency that substantially corresponds to an operating frequency of the pressure generator that generates the flow of gas.

26. The method of claim 22, wherein minimizing the acoustic noise includes providing a microphone generating a control signal for creating the cancellation energy.

27. The method of claim 26, wherein the minimizing acoustic noise includes inverting the control signal from each microphone.

28. The method of claim 27, wherein the minimizing acoustic noise includes providing a speaker creating cancellation acoustic waves as the cancellation energy based on an inverted control signal from one the signal inverter.

29. The method of claim 26, wherein the microphone is an element of at least one of the group consisting of: snore detection means, apnea detection means, breathing disorder detection means, compliance detection means, patient detection means, voice recognition control means, means for conveying audible sounds to the user, breathing pattern detection means, patient monitoring means, diagnostic means, and auto-titration means.

30. The method of claim 22, further comprising providing a valve to control the flow of gas delivered to such a patient, and wherein minimizing acoustic noise includes dithering the valve at a selected dither frequency as the cancellation frequency that substantially matches an operating frequency of the pressure generator.

31. A method for reducing acoustic noise of a medical device having a housing and a noise source mounted in the housing, the method comprising the steps of:
detecting, within the housing, characteristics of acoustic noise associated with the noise source; and

creating a cancellation energy, within the housing, that at least partially cancel acoustic waves generated by the noise source.

32. The method of claim 31, wherein creating a cancellation energy includes creating cancellation acoustic waves via speaker as the cancellation energy that at least partially cancels acoustic waves generated by the noise source.

33. The method of claim 31, wherein creating the cancellation energy includes creating cancellation mechanical vibrations as the cancellation energy that at least partially cancels the acoustic noise.

34. The method of claim 33, wherein creating cancellation mechanical vibrations includes causing a pressure/flow control valve to oscillate at a selected dither frequency that substantially corresponds to an operating frequency of the pressure generator that generates the flow of gas.

35. The method of claim 31, further including the step of generating a control signal for creating the cancellation energy.